REMARKS/ARGUMENTS

The present Amendment is responsive to the final Office Action mailed June 17, 2009 in the above-identified application.

New claims 22 and 23 are added. Therefore, claims 12 and 14-23 are the claims currently pending in the present application.

Claim 12 is amended to clarify features recited thereby. This amendment is fully supported by Applicant's disclosure, see, for example, Specification, page 1, lines 21-25; page 2, line 8, and page 9, lines 6-11 (discussing a high output pulse energy).

Rejection of Claims 12, 14-16, 18-20 and 21 under 35 U.S.C. § 103

Claims 12, 14-16, 18-20 and 21 are rejected under 35 U.S.C. § 103 as being obvious from Cho et al., "Generation of 90-nJ pulses with a 4-MHz repetition-rate Kerr-lens mode-locked Ti:Al_2O_3 laser operating with net positive and negative intercavity dispersion." Opt. Lett. 26, 560-562 (2001) in view of Szipocs et al., U.S. Patent No. 5,734,503. Reconsideration of this rejection is respectfully requested.

Claim 12 requires a short-pulse laser arrangement comprising a resonator in operation having a positive average dispersion over an operating wavelength range and generating an energy output of 100 nJ or higher, wherein the positive net averaged group delay dispersion of the resonator is in a range between 0 and 100 fs^2.

The Office Action acknowledges (Office Action, page 5) that Cho and Szipocs do not disclose or suggest that the positive net averaged dispersion is equal to or less than 100 fs^2. However, the Office Action cites Proctor for this recitation.

It is respectfully submitted that there would have been no suggestion or motivation for a person of ordinary skill in the art for combining Proctor with the other references to arrive at Applicant's invention as claimed in claim 12. Proctor is directed to a low energy laser oscillator. Proctor was written and published at a time when chirped pulse oscillators (CPO) were unknown and there were no powerful pump lasers available. Thus, Proctor is concerned with energy in the 1 nJ range.

A high energy or a high peak intensity oscillation affects the operation of the laser arrangement since non-linear optical effects may occur and the stability of the laser oscillation may be affected (see, for example, Specification, page 3, second paragraph; page 17, line 6). As is well known, the bandwidth of the laser and therefore its pulse duration critically depend on the

pulse energy. The Proctor reference is directed to low-energy laser arrangements. A low energy laser pulse has different effects than short-pulse laser arrangement comprising a resonator generating an energy output of 100 nJ or higher, as recited in claim 12.

Also filed under separate cover is an Information Disclosure Statement citing the article "Approaching the microjoule frontier with femtosecond laser oscillators: theory and comparison with experiment" by Kalashnikov et al., published in the New Journal of Physics 7 (2005) 217, which explains that experimental observation reveals different dependence of the spectral width on the net cavity GDD in the case a low-energy oscillator (of the type to which Proctor is directed) and a high energy oscillator. The pulse formation and stabilization mechanisms are different for the two types of lasers. The theoretical analysis set forth in the article demonstrates that there are two distinct mechanisms responsible for the stabilization of mode-locking in the positive dispersion regime for low-energy pulses (of a few tens of nJ) and for high-energy pulses, for example >200 nJ. In the case of low-energy pulses, the mode-locking mechanism is soliton-like pulse formation stabilized by gain saturation, spectral filtering or GDD. As described in the Kalashnikov article, these effects cannot account for the stable mode-locked pulsing in the high energy regime (at >200 nJ, for example). In the high energy regime, a distinct pulse-energy related mechanism comes into play to enable stable pulse generation, this mechanism involving saturation of the self-amplitude modulation, see, for example page 6, paragraph 3.1 "high-energy solitary pulse in the PDR" of the Kalashnikov article. Therefore, a person of ordinary skill in the art would have readily understood that the teachings of Proctor cannot be applied directly to high energy oscillators operating in an energy regime several orders of magnitude above that of the oscillator mentioned in Proctor.

Therefore, it would have been understood by a person of ordinary skill in the art that the low-energy oscillation to which Proctor is directed has very different properties than high energy laser pulses of 100 nJ or higher as claimed in claim 12. Thus, there would have been no suggestion or motivation for combining Cho and Szipocs with Proctor to arrive at Applicant's invention as claimed in claim 12.

Claims 14-16, 18-20 and 21 depend from claim 12, and are therefore patentably distinguishable over the cited art for at least the same reasons.

New Claims 22 and 23

New claims 22 and 23 are added so as more fully to claim patentable aspects of Applicant's invention. These amendments are fully supported by Applicant's disclosure, see, for example page 20, line 3 of the Specification.

Claims 22 and 23 depend from claim 12 and are therefore patentably distinguishable over the cited art for at least the same reasons.

In view of the foregoing discussion, withdrawal of the rejection and allowance of the claims of the application are respectfully requested.

THIS CORRESPONDENCE IS BEING SUBMITTED ELECTRONICALLY THROUGH THE PATENT AND TRADEMARK OFFICE EFS FILING SYSTEM ON December 17, 2009

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